

(PCT Article 36 and Rule 70)

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/EP2004/014071

## Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of:
- ☐ international search (Rule 12.3 and 23.1(b))
- ☐ publication of the international application (Rule 12.4)
- ☐ international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the **elements** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:
- ☐ the international application as originally filed/furnished
- ☒ the description:
- pages 1-9 \_\_\_\_\_ as originally filed/furnished
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the claims:
- nos. 6, 7 \_\_\_\_\_ as originally filed/furnished
- nos.\* \_\_\_\_\_ as amended (together with any statement) under Article 19
- nos.\* 1-5 \_\_\_\_\_ received by this Authority on 13.10.2005 with letter of 11.10.2005
- nos.\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ the drawings:
- sheets \_\_\_\_\_ as originally filed/furnished
- sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- sheets\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/EP2004/014071

Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement		
1.	Statement		
	Novelty (N)	Claims <u>1-5</u>	YES
		Claims _____	NO
	Inventive step (IS)	Claims <u>1-5</u>	YES
		Claims _____	NO
	Industrial applicability (IA)	Claims <u>1-5</u>	YES
		Claims _____	NO
2.	Citations and explanations (Rule 70.7)		
1	<p>This report makes reference to the following documents:</p> <p>D1: PATENT ABSTRACTS OF JAPAN vol. 2002, no. 12, 12 December 2002 &amp; JP 2002 226622 A (HITACHI CHEM CO LTD), 14 August 2002</p> <p>D2: EP-A-0 915 126 (BASF AKTIENGESELLSCHAFT) 12 May 1999</p> <p>D4: US 2003/162852 A1 (CHAUDHARY BHARAT I ET AL) 28 August 2003</p>		
2	<p>D1 describes expandable particles based on acrylonitrile-styrene copolymers with different molecular weights.</p> <p>However, D1 does not appear to describe either a mixture of styrene copolymers and standard polystyrene or the weight average molecular weights claimed in the present main claims.</p> <p>The subject matter of the present main claims 1, 4 and 5 therefore appears to be novel over D1 (PCT Article 33(2)).</p>		

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/EP2004/014071

Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
3	<p>D2 (claim 1; paragraphs [0018], [0019]) discloses expandable styrene particles based on styrene polymers with bimodal molecular weight distribution.</p> <p>D2 describes, as a starting compound, a mixture of styrene and possibly an additional comonomer, said mixture being initiated by two different peroxides. A mixture of styrene polymers having different chemical compositions, as claimed in the present claims, cannot be obtained by means of such a method.</p> <p>The subject matter of the present main claims 1, 4 and 5 is therefore novel over D2 (PCT Article 33(2)).</p>
4	<p>D4 (claims 1, 2; paragraphs [0096]-[0103]) describes a method of producing expandable styrene polymer granules, said method having the following steps:</p> <p>a) producing a molten mixture of i) optionally smaller amounts of a styrene homopolymer or copolymer having a molecular weight of 2,000 to 50,000 g/mol, ii) a styrene homopolymer or copolymer having a weight average molecular weight of 100,000 to 500,000 g/mol, and iii) a styrene-containing interpolymers;</p> <p>b) mixing in an organic blowing agent at a higher</p>

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/EP2004/014071

Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
	<p>temperature, and</p> <p>c) cooling the expandable mixture, extruding through the die plate and pelletizing the extruded strand.</p> <p>In order to arrive at the subject matter of the present claims 1, 4 and 5, a person skilled in the art would, however, have to select polymer i) as styrene copolymer and polymer ii) as standard polystyrene. Weight ratios as specified in the present claims are also not suggested by D4.</p> <p>The subject matter of claims 1, 4 and 5 therefore appears to be novel over D4 (PCT Article 33(2)).</p> <p>5 D4 is considered to be the closest prior art.</p> <p>The distinguishing feature of the present claims 1 and 4 is considered to be the chemical composition and the weight distribution of the styrene polymers.</p> <p>Since a technical effect of the present application in relation to D1 is not discernible, the objective problem to be solved is considered to be that of providing other expandable styrene polymer granules.</p> <p>D4 explicitly describes exclusively mixtures of 50-60% by weight of a polystyrene homopolymer and 40-50% by weight of a polystyrene interpolymer</p>

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/EP2004/014071

Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
	<p>with an undefined molecular weight. Weight ratios as claimed in the present claims are used only in comparative example 3.</p> <p>None of the other prior art documents, either alone or in combination with the teaching of another document, even remotely anticipates the use of bimodal polystyrene mixtures as proposed in the present main claims.</p> <p>The subject matter of main claims 1, 4 and 5 therefore involves an inventive step within the meaning of PCT Article 33(3).</p>